would have been fidgeting and out of harmony with the even tenor of the text, which is about as different as it can possibly be from the productions of German authors.

I do not myself think it a good plan to incorporate formulæ in the text, so that there is nothing for the eye to catch. Such a proceeding may be convenient to the printer, but it is only permissible when the expressions are very simple and easy ones. However, all those in this book are simple and easy ones, so possibly no student need feel any inconvenience.

So far as I have observed, the statements made are usually clear and correct. There are some few exceptions; for instance, the definition of self-induction on pp. 814, 815 is not satisfactory. On p. 858 the distance apart of points, between which unit difference of magnetic potential exists, is unnecessarily specified in the definition of Verdet's constant; but this is a slip made also in Everett's "Units," and is an easy one both to make and to correct.

The account of a volume-air-thermometer given on p. 295 can hardly pass muster; and indeed this and other meagre references to the work of Regnault may be taken as typical of the absence of even the outlines of those experimental details which one is accustomed to find in the writings of French authors.

But, as I said at the beginning, the attempt to compress all physics into one volume of reasonable size and good print can only be made if one is content to omit about 90 per cent. of what might be included. As a convenient summary of a course of lectures of a particular grade the book is probably about as good as can be expected, and it may be found useful for revision-work by students in this country.

Oliver Lodge.

BABYLONIAN COSMOLOGY.

Die Kosmologie der Babylonier. Studien und Materialen von P. Jensen. (Strassburg.)

THE thick volume of five hundred and fifty pages of closely printed matter lying before us represents what was originally intended by its author to be the first part of an exhaustive treatise upon the mythology of the Babylonians in the widest sense of the term, but he was obliged to abandon the scheme after investigating the spiritual and religious views of the Babylonians which the cuneiform texts make known to us, because he was driven by facts to admit that any such attempt would, with our present information, be premature. Prof. Jensen has then contented himself with placing in the hands of his readers a series of facts and a collection of materials for making researches into the astronomical system of the Babylonians, together with the results which he deduces from them. He is fain to admit that the present state of the study of this subject is lamentable in the extreme; for those who have worked at it in times past, and even those who still profess themselves to be devoted to the science, link idea to idea without regard to natural sequence, and draw conclusions, and invent systems, and give themselves over to traditions rather than to the serious discussion of the facts and statements of the cuneiform texts. Other writers being naturally incapable of distinguishing what is certain from that which is not, and possessing neither the knowledge necessary to control the work of Assyriologists, nor the power to work independently, reproduce the statements given doubtfully by scholars, and send them among non-experts as incontrovertible facts, and thus it comes that the greater part of the work which is current under the name of "Babylonian Mythology" must be considered base coin only.

The earliest worker in the field of Babylonian Astronomy was the famous Dr. Hincks, who published the result of his investigations of some cuneiform texts in the British Museum in the Transactions of the Irish Academy in 1856. In 1862 Sir Henry Rawlinson, the "Father of Assyriology," discovered that most important document now universally known as the "Eponym Canon," in which an eclipse of the sun was mentioned. As Dr. Hincks overlooked the fact that the greater number of the texts which he regarded as astronomical were purely astrological, this discovery by Sir Henry Rawlinson of the notice of an astronomical event recorded by the Babylonians, the accuracy of which could be demonstrated by modern mathematical calculations, must be considered as the first step towards a scientific elucidation of Babylonian astronomy, and a proof that pure astronomical science already existed in the Euphrates Valley as early as B.C. 700. In 1871 the veteran Assyriologist, Jules Oppert, published in the *Journal Asiatique* the results of his study of some syllabaries, and other texts in which the Babylonian names of the planets and other stars were given, and three years later Prof. Sayce published a lengthy paper entitled "The Astronomy and the Astrology of the Babylonians," in the Transactions of the Society of Biblical Archæology, in which he reprinted, without making a new collation, most of the astrological texts published by Rawlinson in "Cuneiform Inscriptions of Western Asia," vol. iii., to which he added English translations. On the work of these two last-mentioned Assyriologists Prof. Jensen makes some strong comments.

Passing over smaller works by Schrader and Lotz we next strike firm ground in the excellent work by Drs. Epping and Strassmaier. The former is an astronomer of no mean skill and ability, and the latter is one of the greatest experts in modern cuneiform decipherment and is thoroughly skilled in working at the tablets at first hand. In the work entitled "Astronomisches aus Babylon," Freiburg i. B. 1889, these scholars published the texts from three tablets of lunar ephemerides for the years 188, 189, and 201 of the era of Seleucus, which began B.C. 312, together with a long astronomical commentary upon them and remarks upon Babylonian ephemerides of planets in general. From these texts it was evident that the Babylonians were accustomed to tabulate the heliacal rising and setting of the planets and of Sirius, and the opposition of the planets to the sun, and it was discovered that they had in the ecliptic a number of groups of stars, twelve of which correspond roughly in nomenclature and in position with the signs of the Zodiac. When this important publication appeared Prof. Jensen had for some years been independently working at the history of the origin of the Zodiac, and a large portion of his work now before us was already in type. A careful study of the

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new matter and of the theories based upon it by Drs. Epping and Strassmaier convinced him of the general correctness of the results of his own investigations, at which he had arrived by a method peculiarly his own, and by many new readings of the cuneiform names of planets and stars which he was enabled to explain satisfactorily he confirmed several identifications of stars which had been pointed out by Dr. Epping by the light of mathematical astronomy. It is but fair to say that at the outset some differences of opinion existed between these distinguished scholars, but already many of them have been adjusted, and the proof of the general accuracy of the work is therefore much stronger.

Prof. Jensen divides his book into two sections. In the first he treats of the "Universe and its Parts," and in the second of the "Creation and of the Formation of the World." Under the first heading, in a series of chapters, he discusses the sky and the heavenly bodies in it, special attention being paid to the consideration of the Zodiac, the earth, the Mountain of sunrise, the abodes the blessed dead and of the damned, and of the Okeanos; and under the second he translates and explains the Babylonian texts referring to the Creation and to the Deluge. Many of Prof. Jensen's ideas are new, and will therefore fail to be accepted by those who prefer to follow traditions and their own views in preference to results obtained directly from the cuneiform texts which are, after all, our only trustworthy authority on Babylonian cosmology. He argues his propositions in a sober manner, and he arranges his facts with clearness; he gives proof or authority for every statement, and he assumes or takes for granted little or nothing. Prof. Jensen's book is a careful statement of all the important views of the Babylonians concerning the system of the heavens and the earth as recorded by the official astronomers and astrologers attached to the library of Assurbanipal at Nineveh about B.C. 660. His work will command the respect and earn the gratitude of all true scholars, even of those who may disagree with him, and by reason of it the scientific astronomer of to-day with his telescope and spectroscope and instruments for stellar photography will respect his predecessors on the plains of Mesopotamia, who differ from him in their calculation of the length of the average period between new-moon and new-moon by two-fifths of a second only!

OUR BOOK SHELF.

Elements of Physiography. By Hugh Dickie, LL.D. Collins Science Series. (London: Collins.)

THIS is a small manual designedly written as a text-book for the elementary stage of physiography, according to the syllabus of the Science and Art Department. All that is necessary for this stage is treated of within its pages in as concise and brief a manner as possible.

Interspersed amongst the text are upwards of 100 excellent illustrations and four coloured maps, and very good sets of questions for exercise are inserted at the end of each chapter

The author would do well to be a little more precise and accurate in some of his statements. In Article 150, p. 138, he says: "The position of a star in the sky is fixed as follows:—(1) Its angular distance E. or W. of the line passing through the poles." Which particular one of the infinite number of lines passing through the poles is meant is not very clear. He should have "fixed" the line by adding "and the zenith." At the end of Article 154 he states that "comets and nebulæ are bodies less dense in their composition than stars, and more erratic in their movements." Surely the author should know that nebulæ do not appear to wander about amongst the stars, but keep the same relative position with respect to the latter.

Upon the whole, however, the book, which is moderate in price, can be recommended to pupils preparing for the examination in elementary physiography.

Seventh Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, 1885-86. By J. W. Powell, Director. (Washington: Government Printing Office.)

THE Report which occupies the first part of this handsome volume is too old to be read with much interest. Happily it is accompanied by papers which are of more than passing value. One of these—on Indian linguistic families of America north of Mexico—is by Prof. J. W. Powell, who, in the course of an elaborate discussion and exposition, throws much light on an intricate and most difficult subject. A paper by Mr. W. J. Hoffman on the Mide'wiwin or "grand medicine society" of the Ojibwa, will be read with pleasure by students of anthropology; and Mr. James Mooney devotes a very careful and interesting paper to the consideration of the sacred formulas of the Cherokees.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. *No notice is taken of anonymous communications.*]

A Remarkable Rainfall.

I SEND a few particulars of the recent remarkable rainfall at Crohamhurst, situated on the western slope of Mont Blanc, a peak on a spur of the D'Aguilar Range, an offset from the Blackall Ranges, South Eastern Queensland. The whole of this district is watered by the Stanley River, a tributary of the Brisbane River, and hence the values given below were prominent factors in producing the terrible floods from which we have suffered. I may mention that the observer at Crohamhurst is Mr. Inigo Owen Jones, one of my specially trained assistants, and that implicit reliance can be placed on his figures.

The following are the more remarkable falls of the flood period at Crohamhurst:—For 24 hours ending 9 a.m. February 1, 10·775 inches; ditto February 2, 20·056 inches; ditto February 3, 35·714 inches; ditto February 4, 10·760 inches. The gauge is a standard of the "eight-inch" pattern, standing one foot above the ground at an altitude of about 1400 feet above mean sea level. The approximate latitude and longitude of Crohamhurst are 26° 50′ S. 152° 55′ E. The gauge was emptied every three hours, night and day, on the occasion of the greatest fall. I think meteorologists will agree that for a 24 hours' fall we have beaten the world's record.

CLEMENT L. WRAGGE,
Government Meteorologist of Queensland
(late of Ben Nevis).

Brisbane, March 22.

The Cold Wave at Hongkong, January 1893.—Its After Effects.

NOW that the cold wave has completely passed away and warm weather is setting in (March 17, 1893), one can write more certainly respecting the effects upon animal and vegetable life.

With regard to the plants the effect has been disastrous, especially on the higher levels, and were it not that our rarest plants descend the hillsides, and often occur in sheltered nooks, this year's frost would have caused the extinction of several of them. Combined with the dry weather we have been enduring the frost has turned our fairly green island into a brown, desert-looking land, much of the undergrowth being dead. Most of the leaves have fallen, even new leaves that were unfolding have

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